

Ocean gales and storms, November, 1930—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Highest force of wind and direction	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN—Continued													
Ambridge, Am. S. S.	Antwerp	New York	49 31 N	40 01 W	Nov. 22	Nov. 22	Nov. 24	29.50	NW	NW, 10	WNW	W, 10	W-WNW.
Tiger, Nor. S. S.	Oslo	do	57 00 N	23 40 W	Nov. 23	8 p., 23	do	28.91	S	WSW, 9	W	WSW, 10	SSW-WSW.
Japan Arrow, Am. S. S.	New York	Canal Zone	37 45 N	73 41 W	Nov. 25	8 a., 25	Nov. 27	29.41	W	W, 7	WNW	W, 11	Steady.
Examalia, Am. S. S.	Gibraltar	New York	36 58 N	56 45 W	Nov. 26	6 p., 26	Nov. 29	29.72	S	S, 10	N	NE, 10	S-SW-W.
Canadian Leader, Br. S. S.	Canal Zone	Boston	17 51 N	75 08 W	Nov. 28	6 a., 28	Nov. 30	29.88	NE	NE, 7	E	SE, 8	Steady.
W. C. Teagle, Am. S. S.	Aransas Pass	do	27 26 N	94 26 W	do	4 p., 29	Nov. 29	30.00	SE	SE, 8	SE	SE, 8	Do.
Tiger, Nor. S. S.	Oslo	New York	48 58 N	47 48 W	Nov. 29	7 p., 29	Nov. 30	29.25	NNE	NE, 11	NNW	NE, 12	NE-NW.
Bremen, Ger. S. S.	Cherbourg	do	47 22 N	36 25 W	do	8 p., 29	do	29.52	SSW	SW, 7	WNW	NE, 11	do.
Ninian, Br. S. S.	Liverpool	Boston	50 00 N	45 23 W	do	11 p., 29	Dec. 3	29.01	NW	N, —	WNW	NW, 12	N-W-SW.
NORTH PACIFIC OCEAN													
Petricola, Br. S. S.	Saito Zaki	San Francisco	40 05 N	153 40 E	Oct. 31	4 a., 1	Nov. 1	29.37	NNE	S, 4	NNE	NNE, 9	S-NNE.
San Julian, Am. S. S.	San Pedro	Balboa	16 00 N	94 50 W	do	4 p., 1	Nov. 2	29.91	NNE	NNW, 9	N	NNW, 10	N-NW-N.
Broad Arrow, Am. S. S.	San Pedro	do	14 23 N	97 18 W	do	Oct. 31	Nov. 4	29.96	NNE	ENE, —	N	NE, 10	Steady.
Admiral Farragut, Am. S. S.	Seattle	Kodiak	59 00 N	152 00 W	Nov. 1	6 a., 1	Nov. 1	29.64	NW	NW, 9	NW	NW, 9	Do.
Starr, Am. S. S.	Seward	Aleutian Is.	53 50 N	167 20 W	do	4 p., 1	Nov. 2	29.14	SE	SE, 8	S	SE, 9	do.
Chief Capitano, Br. S. S.	Shanghai	Vancouver	48 00 N	173 00 E	do	4 a., 2	Nov. 3	29.24	SSE	W, 6	N	W, 11	S-SW-W.
California, Am. S. S.	Columbia R.	Shanghai	50 30 N	178 45 E	Nov. 2	10 a., 2	do	29.15	S	SW, 8	NNW	WNW, 11	SW-WNW.
Admiral Farragut, Am. S. S.	Kodiak	Seattle	59 06 N	150 50 W	Nov. 4	10 p., 5	Nov. 5	29.91	NE	NE, 10	E	NE, 12	NE-E-SE.
Tacoma, Am. S. S.	Tacoma	Yokohama	50 45 N	136 30 W	do	—, 6	Nov. 6	29.37	ESE	ESE, 5	WSW	SW, 10	W-NW.
Olympia Maru, Jap. M. S.	Yokohama	Seattle	45 46 N	174 21 E	Nov. 7	Noon, 7	Nov. 8	29.23	W	W, 7	NW	WNW, 10	do.
Maliko, Am. S. S.	Puget Sound	Hawaiian Is.	48 20 N	123 00 W	Nov. 8	7 a., 8	do	29.72	SSE	SSE, 8	SW	SSE, 8	SSE-S.
Chief Capitano, Br. S. S.	Shanghai	Vancouver	49 45 N	138 36 W	Nov. 9	6 p., 9	Nov. 10	29.20	SSW	SSW, 7	W	WSW, 9	SE-S-SSW.
Pres. Garfield, Am. S. S.	San Francisco	Kobe	26 56 N	170 30 W	Nov. 10	1 a., 10	Nov. 11	29.88	N	N, 7	NE	N, 9	WSW-N.
Dalblair, Br. S. S.	Vancouver	Shanghai	50 03 N	178 42 E	do	4 p., 12	Nov. 12	29.30	S	SSE, 8	NE	S, 10	S-SSE-NE.
San Pedro Maru, Jap. S. S.	Yokohama	San Francisco	39 00 N	161 42 W	do	Noon, 11	do	30.19	NE	NE, 9	SE	NE, 9	NE-ENE.
Columbia Maru, Jap. S. S.	Vancouver	Yokohama	51 45 N	168 55 W	Nov. 11	6 a., 13	Nov. 13	29.68	—	SW, —	W	SSW, 10	SSW-SW.
Tacoma, Am. S. S.	Tacoma	do	50 30 N	171 24 W	do	4 p., 12	Nov. 14	29.39	SSW	SW, 10	W	S, 10	S-SW-WSW.
Pres. Taft, Am. S. S.	Puget Sound	do	41 11 N	148 42 E	Nov. 12	Noon, 12	Nov. 12	29.47	WNW	WNW, 7	W	W, 10	Steady.
Golden Tide, Am. S. S.	Hong Kong	San Francisco	43 31 N	136 45 W	Nov. 14	Mdt, 15	Nov. 16	29.60	W	NW, 10	NNW	NW, 10	W-NNW.
Dalblair, Br. S. S.	Vancouver	Shanghai	45 40 N	156 22 E	Nov. 17	10 p., 17	Nov. 18	29.38	SSE	W, 11	WNW	WNW, 12	SSE-N.
Ayala Maru, Jap. S. S.	Milke	Tacoma	44 50 N	161 10 E	do	3 p., 18	Nov. 19	29.51	SE	W, 10	WNW	W, 11	1 pt.
Starr, Am. S. S.	Seward	Aleutian Is.	58 56 N	152 25 W	do	2 p., 17	do	28.40	NE	NE, 7	W	NE, 10	do.
Manila Maru, Jap. S. S.	Yokohama	Vancouver	45 50 N	165 30 E	Nov. 18	8 p., 18	do	29.44	W	W, 10	WNW	W, 10	W-NW-NNW
Tyndarus, Br. S. S.	Yokohama	Victoria	39 44 N	150 57 E	Nov. 20	Mdt., 21	Nov. 22	29.60	SE	SSE, 8	SW	SSE, 9	SSE-S.
do	do	do	50 03 N	167 20 W	Nov. 24	10 p., 26	Nov. 27	28.55	SSE	S, 9	SE	E, 9	E-SE-S.
Dalblair, Br. S. S.	Victoria	Shanghai	41 40 N	142 38 E	Nov. 21	10 p., 21	Nov. 22	29.50	W	W, 10	W	W, 10	Steady.
Pres. Madison, Am. S. S.	Yokohama	Seattle	49 50 N	156 45 W	Nov. 22	2 p., 25	Nov. 25	29.60	SSE	NW, 7	W	NNE, 9	NNW-W.
San Anselmo, Am. S. S.	New Port News	Los Angeles	15 16 N	93 35 W	Nov. 27	10 a., 27	Nov. 27	29.91	NNW	NNW, —	NW	NNW, 9	Steady.
Admiral Farragut, Am. S. S.	Seattle	Kodiak	58 29 N	152 35 W	Nov. 28	—, 28	Nov. 30	29.59	NNE	NNE, 6	NE	NE, 9	Do.
SOUTH PACIFIC OCEAN													
Lina L. D., Fr. S. S.	San Pedro	Port Pirie	35 32 S	138 16 E	Nov. 3	Noon, 3	Nov. 4	29.41	NNE	—	WSW	WSW, 12	do.

NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure.—Pressure over the most of the North Pacific Ocean in November did not change very materially from that of October, on the average, except over the western waters of the Gulf of Alaska, where there was a considerable fall. Whereas in the previous month the Aleutian Low stretched as a shallow depression from the Gulf far westward into the Bering Sea, in November it was centered as a fairly energetic cyclone near Kodiak, where the average pressure was 29.44 inches, or a tenth of an inch below the normal. At other points in the Gulf of Alaska and in the Bering Sea, as shown by Table 1, the average pressures were slightly above the normal.

The North Pacific anticyclone persisted practically throughout the month over the eastern part of the ocean in middle latitudes. Along the central meridians high pressure was occasionally displaced by moderate depressions during the first two decades, and prevailing so throughout the last of the month. Anticyclonic conditions for the most part overspread the western waters of the ocean between latitudes 20° and 40° N.,

though interspersed by occasional and rather unimportant depressions between Guam and the Asiatic mainland.

The following table gives the principal barometric data for several island and coast stations in west longitudes.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level at indicated hours, North Pacific Ocean and adjacent waters, November, 1930

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	Inch	Inches		Inches	
Point Barrow 1	30.08	—	30.76	3d	29.16	14th
Dutch Harbor 1	29.65	+0.06	30.34	24th	29.04	17th
St. Paul 1	29.71	+0.09	30.58	24th	28.92	13th
Kodiak 1	29.44	—0.10	30.42	12th	28.30	18th
Midway Island 1	30.08	+0.01	30.26	18th	29.80	30th
Honolulu 1	29.96	—0.06	30.12	13th	29.76	25th
Juneau 1	29.79	+0.03	30.74	22d	28.63	15th
Tatoosh Island 1	30.08	+0.11	30.72	21st	29.01	15th
San Francisco 1	30.08	—0.02	30.41	20th	29.68	16th
San Diego 1	30.01	+0.01	30.27	20th	29.75	13th

1 P. m. for average; a. m. and p. m. for extremes.

2 For 29 days.

3 A. m. and p. m. observations.

4 Corrected to 24-hour mean.

Cyclones and gales.—There were at least four major progressive cyclones which occurred in November on the North Pacific. The earliest was that which originated on October 29 over eastern China, and caused severe gales on the 31st, east of Japan. On November 1 this storm was apparently of lessened intensity, with reported winds not exceeding 9 in force, near the fortieth parallel, between 145° and 155° east longitude. On the 2d and 3d, however, as it entered the Aleutian region and intensified the low already existent there, rougher weather resulted, with gales of force 11 reported from near latitude 50° N., between longitudes 170° E. and 180°. On the 3d and 4th it moved rapidly into the Gulf of Alaska, where it remained as an oscillating disturbance until about the 10th.

The second cyclone was that of the 9th to 12th which came out of Asia below Vladivostok and died out in the eastern part of the Bering Sea. This storm, however, inasmuch as it traversed a northerly region across the Sea of Okhotsk and Kamchatka, did not seriously affect any shipping along the trans-Pacific routes.

The third cyclone crossed the Yellow Sea from China on the 15th, and the Japan Sea and northern Japan on the 16th. On the 17th, when central south of the Kuril Islands, although then apparently of no great barometric depth, it was productive of hurricane velocities, as indicated by the report of the steamship *Ayaha Maru*, and on the 18th, farther eastward, by gales of full storm force. On the 19th and 20th the cyclone greatly intensified the Aleutian Low over the eastern part of the Bering Sea and the upper waters of the Gulf of Alaska, and on the following day was central, diminishing, in the Canadian Northwest.

The fourth major traveling cyclone, although shorter in extent of water area traversed, was by no means unimportant. It probably originated on the 16th or 17th as a minor Aleutian disturbance west of the Peninsula of Alaska. On the 18th it had become a powerful cyclone in the Gulf of Alaska, with the barometer at Kodiak falling to its minimum of the month, 28.30 inches. This cyclone moved northward during the 19th and 20th, after which it no longer affected the sea. During its passage of the western part of the gulf it caused high winds, with a maximum recorded force of 11 on the 18th, over a considerable region. The period of great storm intensity, 17th to 19th, south of Alaska, was the heaviest of the month, and during its continuance two distinct and progressive cyclone centers passed over the island of Kodiak.

A traveling cyclone of much less intensity than the foregoing originated near the Hawaiian Islands about the 22d and was central over the northern extremity of the Gulf of Alaska on the 27th, after a passage between two extensive Pacific anticyclones. A few gales, with maximum reported force of 9, attended its northward course.

The month as a whole was little if any stormier than October, the varying degrees of storminess between the months being mostly local. There were fewer days with severe weather in the waters east of Japan, maximum velocities of force 10 east of Hondo and Yezo on the 12th, 21st, and 22d occurring instead of the storm and hurricane velocities of October 26 to 31. In general, south of the Aleutians, although the number of days with gales was probably not greater than in October, the winds were of somewhat higher force, owing to the greater intensity of the lows, forces 9 and 10 being about as

frequent this month as were the forces of 8 in the previous month. Their numbers may be determined by reference to Table 1. Between Kodiak and the mainland to the northward hurricane winds from the northeast occurred on the 5th. Scattered strong to whole gales were experienced east of Midway Island on the 10th, and at some distance off the California coast on the 15th and 16th, the latter resulting from cyclonic activity extending far southward from Alaskan waters.

Few high wind velocities occurred except locally within the tropics. A fresh northeast gale was experienced east of the Mariannas on the 8th, in connection with a disturbance of low latitudes that also caused fresh gales ten degrees to the northward on the 11th. To the southeastward of the Hawaiian Islands fresh east and northeast gales on the 13th and 14th indicated merely a strengthening of the trades due to intensified high pressure gradients.

Over and south of the Gulf of Tehuantepec fresh to strong or whole gales blowing as northers, due to strong anticyclones extending southward from the United States, occurred from the 1st to 6th, and on the 23d, 24th, and 27th.

At Honolulu the prevailing direction of the wind continued from the east, with a maximum velocity of 28 miles an hour from the same direction on the 16th.

Fog.—The number of days with fog in November lessened appreciably in most localities over the number in October. There were widely separated occurrences of fog on six days, as reported from upper east longitudes, and approximately the same number in upper and central waters of west longitudes. In no part of the ocean away from the coasts was fog reported on more than three days for a given locality. The frequency was somewhat greater along the American coast, and between Eureka and central Lower California fog was encountered on from six to eight days.

TYPHOONS AND DEPRESSIONS

A VERY SMALL TYPHOON OVER THE VISAYAN ISLANDS, NOVEMBER 2 TO 3, 1930

By REV. JOSÉ CORONAS, S. J.

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After two months of an extraordinary absence of typhoons, the Philippines were suddenly visited by a very small typhoon during the night of November 2 to 3. Because of its small diameter and of its great rate of progress, the typhoon entered the Archipelago without giving sufficient time for any warning. The center entered the eastern coast of southern Samar at about 9 p. m. of the 2d; it passed close to Tacloban at about 11 p. m.; and, after traversing the northern part of Leyte, Cebu, and Negros Islands, it passed very near to Iloilo at about 5.30 a. m. of November 3. The typhoon moved from Leyte to Iloilo at the extraordinary rate of over 22 miles per hour. With the exception of the portion of the track between Tacloban and Ormoc, the direction of the typhoon was West by South.

Although the depth of the typhoon was not very great, yet much damage was done to several towns, specially to those on the north side of the track owing to the considerable force obtained by the northerly winds prevailing during this part of the year. Thousands of people were homeless after the storm, particularly in the Province of Iloilo.